

DOCUMENT RESUME

ED 266 129

SP 027 238

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TITLE A Comparative Study on the Effects of Traditional versus Wholistic Physical Fitness Programs.
PUB DATE [83]
NOTE 35p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Comparative Analysis; Conventional Instruction; Higher Education; Holistic Approach; Physical Education; *Physical Fitness; Stress Management; *Training Methods

ABSTRACT

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A Comparative Study
on the Effects of
Traditional versus Wholistic
Physical Fitness Programs

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Running head: TRADITIONAL VERSUS WHOLISTIC PHYSICAL FITNESS

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Abstract

This experimental investigation compared the traditional and wholistic approaches of physical fitness. Volunteers from a physical education class were randomly assigned to three experimental groups, physical fitness (F), fitness/stress management (FS) and fitness/stress management/wellness (FSW). A control group (C) was selected from volunteers of a personal health class. Pre-post testing of subjects included: height, weight, skinfold thickness and percent fat measurements, sit and reach test, ten minute submaximal treadmill test, State Trait Anxiety Inventory (STAI), Holmes-Rahn Stress Test, Personality Stress Test (PST), Cornell Medical Index (CMI), Tennessee Self Concept Scale (TSCS) and the Canadian Lifestyle Indicator. During a seven week period subjects received treatment according to their designated group. Statistical data analysis employed the ANOVA and Duncan's Multiple Range Test at the .05 alpha level. Results indicated subjects receiving a wholistic approach to physical fitness were not significantly different from those in the traditional physical fitness program.

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Introduction

The current interest on fitness in our lives reflects a concern for the overall wellness of our society. The knowledge that communicable diseases have, for the most part, been controlled leads to the alarming conclusion that the primary causes for death and illness among modern man are due to environment and lifestyle. The current emphasis on wellness is a reflection upon the realization that a change in lifestyle is a major key in enhancing the quality of life. Frequently it has been the individual's commitment to begin an exercise program that has been the primary factor leading to a whole series of lifestyle changes (Pollack, Wilmore & Fox, 1978).

Business and industry are becoming increasingly interested and supportive of health care programs, including programs designed to enhance physical fitness (Ryan, Larson, Wilbur, Colacino & Fogle, 1980). Reduced levels of absenteeism, turnover rates and improved productivity have been some of the results of a complete fitness program (Cox, Shepard & Corey, 1981). A trend toward lower health and life insurance rates for regular exercisers has occurred during the last several years. The benefits of a health-oriented wellness program, including personalized exercise programs, should be the key to enhanced personal well-being and health.

The medical profession is also beginning to view

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cardiovascular illness in a different light. Cardiovascular problems are being treated with techniques more comprehensive than surgery. Nutrition education, stress reduction methods, life style revisions, and exercise are becoming the major tools to disease prevention and control. It is interesting, then, that the area of physical fitness has still remained relatively traditional in its approach. Although there is a substantial body of knowledge on the effects of physiological training on physical fitness, there is a void in the understanding of a more wholistic definition and approach. This proposed investigation will attempt to validate the effects of traditional and wellness training programs on adults.

Background

Information in the area of training has recently centered around the effects of training on cardiovascular efficiency. Researchers have been trying to identify the relationship between cardiovascular conditioning and cardiovascular disease. Although the cause of cardiovascular disease is unknown, there are a number of associated risk factors. The control of some of these risk factors: (e.g. smoking, hypertension, hyperlipidemia, obesity, diabetes, personality traits, and physical inactivity) depend upon a broad approach to changing lifestyle.

Accordingly, there is ample proof to demonstrate that

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exercise programs have profound effects on physiological well-being (Cooper, 1977; Hage, 1982; Mayer, 1975; Pollock, Wilmore & Fox, 1978; Rotkis, Cote & Coyle, 1982). The function of the heart is enhanced as demonstrated by reduced heart rates and greater stroke volume at rest and during submaximal work. The a-v O_2 difference of the blood is greater. These changes bring about an increase in maximal aerobic capacity which provides more energy to the working muscles while diminishing fatigue (Pollock, et al., 1978; McArdle, Katch & Katch, 1981; Fox & Mathews, 1981; Ryan, et al., 1979).

This type of physiological inquiry has increased as people's interest in physical conditioning has accelerated. Tennis, racquetball and running are examples of our country's latest social attempts at becoming fit. Many people pursue strenuous activity, not only for physiological conditioning, but also as a way to vent emotions and to "relax". Unfortunately, current knowledge about relaxation is very naive. Activities such as tennis, running, gardening, and reading are not necessarily effective ways of reducing stress. In fact, "a person can still maintain both the mental anxiety and the neurophysiological functioning characteristics of prolonged, unabated stress" . . . while engaging in these types of activities (Pelletier, 1983, p. 23).

The effects of stress on daily life functioning at home,

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work, and play, as well as the emotional and physical effects on the individual, are well-documented (Benson, 1975; Brown, 1981). Accordingly, a wholistic fitness program should address not only physical training and conditioning, but also mental conditioning via stress management. A few research studies have investigated the effects of stress management and physical training on physiological measures (Benson, Dyer & Hartley, 1978; Suinn, Morton & Bennel, 1980; Ziegler, Klinzing & Williamson, 1982). All of these studies demonstrated a significant decrease in oxygen consumption and/or heart rate on groups that received stress management strategies and physical training versus the physical training only groups.

In industry and corporation wellness training, programs are showing popular support. Often times the scope of these programs include cardiovascular health, smoking cessation, dietary counseling and exercise programs with an individualized health prescription written for each employee (Cook, Walden & Johnson; 1979, Dedmon, 1979; Golaszewski, Tomik, Pyle & Pfieffer). However, research designed programs that prescribe the most beneficial wholistic health program for the individual have not surfaced in the area of corporate fitness and wellness training.

Due to the timely importance of the wellness issue in contemporary life and because of the lack of controlled research

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in this area, this study investigated differences among three types of training programs: physical fitness, fitness/stress management, and wellness training (fitness/stress management/healthful living).

Methodology

Sample

Volunteers from a required university physical education class were solicited as subjects for the study. All volunteers signed an informed consent after an orientation to all testing procedures. Following pre-testing each subject was randomly assigned to one of three experimental groups. A fourth group of controls was selected from volunteers in a personal health class.

Group F (physical fitness) participated only in physical fitness activities three times per week for 45 minutes. Group FS (physical fitness/stress management) participated in 20 minutes of stress management training and 25 minutes of physical fitness activities during each of the three sessions per week. Group FSW (physical fitness, stress management, and wellness training) participated in 20 minutes of stress management training and 25 minutes of physical fitness training twice per week. Group FSW participated in a 45 minute discussion on wellness topics once a week. Each experimental group had five subjects.

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Group C (control) participated in the pre and post-testing only. These six subjects were told to maintain their life-style related to exercise, stress management, smoking, and nutrition throughout the experimental period.

Procedures

Physical Fitness

The subjects were instructed to avoid food and smoking for three hours preceding their physical fitness evaluation as well as to avoid prior exercise that day. Skinfold measurements were taken at the abdomen, iliac, triceps, and anterior thigh with a Lange skinfold caliper. Each site was measured three times and the average was used to determine total skinfold thickness and percent fat (deVries, 1971). Flexibility was measured using the sit and reach test with a score of 15 inches equal to touching the toes.

A ten minute submaximal treadmill test was administered to determine changes in cardiorespiratory function. Each subject walked at 2.5, 3.0, or 3.5 mph depending upon their ability to walk comfortably. Regardless of speed, the treadmill grade started at 0% and was raised 2.5% every two minutes. Heart rates were recorded by means of ECG recordings prior to exercise, during each minute of exercise and the five minute recovery period. Blood pressure was taken prior to exercise,

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during the eighth minute of exercise, and during the fifth minute of recovery. Oxygen consumption during exercise was measured by means of open-circuit spirometry during minutes two, six, and ten. During recovery the subjects continued to walk for the first two minutes as the treadmill elevation was decreased to 0% grade then were seated for the last three minutes.

The primary goals of the physical fitness training program were to develop flexibility, improve body composition and enhance cardiorespiratory endurance. Each activity period began with 10 minutes of warm-up exercises, including those that emphasized flexibility. Groups FS and FSW participated exclusively in aerobic activities for the 15 minutes remaining after warm-up. These aerobic activities were primarily brisk walking and jogging. Training heart rates of 70-85% of predicted maximum heart rate ($220 - \text{age}$) were used to determine exercise intensity. Distances walked or ran varied from 0.8 to 2.5 miles per session amongst the subjects in the three experimental groups.

Group F also participated in circuit training after completing their aerobic activity. Three circuits were used. Each circuit included 10 exercises and emphasized muscular strength and endurance, flexibility, and cardiorespiratory endurance.

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Stress Management

The pre-post assessment for stress management was conducted on days when other testing sessions were not scheduled. Three assessment tools were utilized. These tools include: The State Trait Anxiety Inventory (STAI), the Holmes-Rahn Stress Test and the Personality Stress Test.

The STAI was used to assess levels of trait anxiety. Trait anxiety referred to the subjects underlying predisposition to experience stress in general. The Holmes-Rahn stress test provided a rating scale of life stressors (i.e., divorce, economic difficulties, holidays, deaths, etc.). Subjects assessed, in very general terms, the level of stress in their current lives. Finally, the Personality Stress Test (PST) was used to assess the Type A personality. This test purported to assess the elements of (1) intense sense of time urgency (2) inappropriate aggression and hostility, (3) polyphasic behavior, and (4) goal directedness without proper planning. The STAI and the PST were used as the pre-test and the post-test. The stress management information that was discussed and practiced during the seven week program included: introduction to the effects of stress on physical, emotional, social and family well-being, abdominal breathing, tense-relax exercises, differential relaxation, imagery training, fantasy, autogenic ideas,

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cognitive coping techniques and models, and the development of an on-going stress management program for each individual.

Wellness Training

As part of the wellness approach, selected area of the healthy personality were explored to expand the total picture of health and well-being with its relationship to stress management and physical fitness.

The topics covered during the seven week wellness training program included: emotional states of consciousness, spirituality, sociocultural wellness, stress and health maintenance, nutrition, physical exercise as it relates to healthy living, environmental stressors and body response, and the total dimension of wholistic health.

During the pre and post testing sessions the subject's level of wellness and wholistic health was measured by three indices: the Cornell Medical Index (CMI), Tennessee Self Concept Scale (TSCS), and the Canadian Lifestyle Indicator.

All variables for this study were analyzed using ANOVA ($\leq .05$) with significant differences determined with the Duncan Multiple Range Test.

Results

Physical Fitness

The physical characteristics of each group are found in Table 1.

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Insert Table 1 about here

Three variables related to physical fitness demonstrated significant F-ratios. Skinfold totals were greater (8.7) for Group FSW after training. This group also had significantly greater skinfolds both before and after training as compared to each of the other groups. Group F post-test skinfold (67.0) was less than both Group FS's and C's pre-test mean scores. (See Table 2)

Insert Table 2 about here

As found in Table 3 the pre-test diastolic blood pressure of 76 mmHg for Group FSW was greater than all other groups' pre and post-test scores with the exception of Group FS's post-test score.

Insert Table 3 about here

Oxygen pulse during the tenth minute of treadmill exercise was significantly less for Group C on both the pre and post-test as compared to all values for the three experimental groups. Group F had an increase in oxygen pulse with training. The

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pre-test value for Group F was less than that of Group FS's and FSW's pre and post-test values. Group FS's had a significant increase in oxygen pulse and the pre-test score for this group was less than the post-test score for Group FSW. Group FS's post-test value was significantly more than Group FSW's on the pre-test. All other physical fitness variables measured including: percentage fat, pre-test heart rate, exercise heart rates, recovery heart rates, pre-exercise and recovery consumption, oxygen pulse during minutes one and six, and flexibility were not significantly affected by training.

Stress Management

Results of the STAI analysis indicated that no statistically significant differences emerge between groups $F(3,16)=2.17$ $p < .07$. It was interesting to note that only one of the groups (FS) demonstrated the desired decrease in the STAI scores from pre to post testing. The control group indicated a slight increase in STAI scores, whereas both the fitness only and wellness group remained unchanged. In only the fitness/stress group did the desirable downward trend occur between the pretest scores ($\bar{X} = 31.25$) and the post test scores ($\bar{X} = 28.75$). (See Figure 1)

Insert Figure 1 about here

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Results of the Type A behavior were similar. The between group differences across time yielded no statistically significant difference, $F(3,16) = 2.53 < .09$. However an interesting trend evolved from this analysis. The two groups (F and C) that did not receive any form of stress management increased in their Type A scores. Conversely, both groups (FS and FSW) that received stress management training were able to decrease their Type A behavior during the course of this study.

Wellness

The CMI questionnaire was used to indicate each subject's overall level of health. Questions were answered on a nominal level of measurement with data results indicating all participants possessed a normal status of health with no physical or mental conditions that would have biased the results of the study.

The TSCS measured ten variables of the self concept: total positive, self criticism identity, self satisfaction, behavior, physical self, moral-ethical self, personal self, family self and social self. Comparisons and interactions of the four group's scores (pre-post) indicated no significant difference in the ten variables.

The Canadian Lifestyle Indicator was employed as a subject's health risk appraisal. This instrument surveyed the lifestyle factors of cardiovascular risks, nutritional habits, emotional

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and social management, physical activity and safety.

Statistical analysis indicated no significant difference in pre and post score analysis.

Discussion

An individualized program designed to improve the wellness of its participants would be expected to have slightly different results depending upon the exact structure of the program. This study attempted to look at three possible general alternative programs.

The increase in skinfold thickness experienced by Group FSW is not a typical finding in programs designed to enhance physical fitness. One explanation is be that the subjects increased their caloric intake proportionally more than the caloric expenditure of the exercise program. The typical response to aerobic exercise is decreased weight and body fat, but the duration and frequency of exercise may not have been adequate to achieve this end. Another explanation is also possible. It is our experience that thicker skinfolds, as found in Group FSW, are not as reliable as are less thick skinfolds. Although care was taken to measure each site three times, slightly larger measurements may have occurred due to experimental error. The fact that the weight of Group FSW actually decreased would support this possibility.

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Although not statistically significant (see Figure 2) each of the experimental groups responded to training with lower exercise heart rates, while the control group remained essentially unchanged. This result has been shown repeatedly to occur as a result of aerobic training programs.

Insert Figure 2 about here

Group F performed approximately one third and one half more aerobic exercise than did Groups FS and FSW respectively. This did not, however, translate into a greater training effect on heart rate. Evidently the threshold for reducing working heart rates in this study was no greater than 10-15 minutes of aerobic exercise twice per week.

Blood pressure amongst the subjects in this study was in the normal to low category at the start of the study. Group FSW, perhaps as a result of stress management training, had a decrease in an already relatively low resting diastolic blood pressure readings.

The increased oxygen pulse found during the tenth minute only amongst the experimental groups was not due to changes in oxygen consumption, but rather lower exercise heart rates. The efficiency of the cardiovascular system was enhanced as the same amount of oxygen was consumed as heart rate decreased. (see Figure 3)

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Insert Figure 3 about here

The primary effect of this study on physical fitness training, as a part of a wellness program, was the typical response of lower working and recovery heart rates. Other effects on blood pressure, oxygen consumption and flexibility were negligible.

The lack of statistically significant differences between groups in their ability to decrease STAI and Type A scores were interesting. It could well be that the natural time restrictions placed on this study accounted for the developing but non-significant trends in the data. It may have been unreasonable to expect that 20 minute stress management sessions, three times per week for the FS group and 2 times per week for the FSW group, were sufficient to develop the skills needed for behavioral and cognitive change in stress management. It was encouraging to note during the post testing time period (that coincidentally corresponded to final exam week) only the two groups (FS and FSW) that received minimal stress management were able to reduce their Type A behavior. The control and fitness group increased in their Type A behavior.

Although the wellness questionnaires which measured the subjects' self concept and lifestyle health risks did not reveal

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a significant difference between groups a couple of points should be highlighted. First, analysis of the ten self concept variables by the TSCS profile sheet did reveal a positive self concept increase by all three experimental groups, specifically in the areas of the total positive self, one's personal self satisfaction and physical self. Secondly, the lifestyle analysis questionnaire when plotted by research groups suggested a wholistic approach to health may be more beneficial to the person because of the total exposure of wellness variables. Only the FSW group demonstrated this anticipated trend moving from a risky to a good lifestyle in the pre and post testing. (See Figure 4)

Insert Figure 4 about here

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Summary

A program designed to improve the wellness of its participants would be expected to have slightly different results depending upon the exact structure of the program. This study attempted to look at three possible alternatives.

This study was in part limited by the relatively short classroom periods for contact during each training session. Both the aerobic and stress management phases of training were limited by natural time constraints. Aerobic training for 30 minutes is far more likely to produce a training effect than is a 15 minute program. Similarly, the amount of time needed for content, delivery and practice may be greater than the 20 minutes allotted two to three sessions per week.

Another limiting factor was the motivational level of the subjects. They were recruited from required physical education classes. Therefore, they may not be representative of subjects who seek out, voluntarily, programs offering a variety of health packages including: physical fitness, smoking, cessation, blood pressure, motivation weight and substance abuse control. Participants in such diverse wellness programs have the opportunity to select those aspects of the program which meet their personal needs. The present study was not designed to meet the needs of the individual participants, but rather required participation in the group to which a subject was assigned. Subjects of this type may not respond with the same degree of commitment to initiating changes in life-style, as would volunteers freely choosing to participate in selected aspects of a program.

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References

- Benson, H. (1975). The relaxation response. New York: William Morrow & Company.
- Benson, H., Dryer, T., & Hartley, L. (1978). Decreased VO_2 consumption during exercise with elicitation of the relaxation response. Journal of Human Stress, 4, 38-42.
- Brown, J. (1981). An incentive-based employee fitness program. Health Education, 12(2), 23-24.
- Cook, R., Walden, R., & Johnson, P. (1979). Employee health and fitness program at the Sentry Corporation. Health Education, 10(4), 4-6.
- Cooper, K. (1977). The aerobics way. New York: M. Evans & Co.
- Cox, M., Shepard, R. & Carey, P. (1981). Influence of an employee fitness program upon fitness, productivity and absenteeism. Ergonomics, 24(10), 795-806.
- Dedmon, R. (1979). Health management program at Kimberly-Clark Corporation. Health Education, 10(4), 7.
- deVries, H. (1971). Laboratory experiments in physiology of exercise. Dubuque: Wm. C. Brown Co., Publishers.
- Fox, E. & Mathews, D. (1981). The physiological basis of physical education and athletics. Philadelphia: Saunders College Publishing.

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- Golaszewski, T., Tomik, W., Pyle, R. & Pfiefer, G. (1982). Competency identification, evaluation and improvements for corporate health program fitness specialists: Health education variables. Health Education, 13(4), 32-35.
- Hage, P. (1982). Diet and exercise programs for coronary heart disease: Better late than never. PSM, 10(9), 121-126.
- McArdle, W., Katch, F. & Katch, V. (1981) Exercise physiology: Energy, nutrition and human performance. Philadelphia: Lea & Febiger.
- Mayer, J. (1975). A diet for living. New York: Pocket Books.
- Pelletier, K. (1983). Mind as healer, mind as slayer. New York, New York: Dell Publishing Co.
- Pollock, M., Wilmore, J. & Fox III, S. (1978). Health and fitness through physical activity. New York: John Wiley & Sons.
- Rotkis, T., Cote, R., Coyle, E. (1982). Relationship between high density lipoprotein cholesterol and weekly running mileage. Journal of Cardiac Rehabilitation, 2, 109-112.
- Ryan, A., Larson, R., Wilbur, C., Colacino, D., & Fogle, K. (1980). Employee fitness program. PSM, 8(5), 63-72.
- Ryan, A., Mayer, B., Pappenbarger, R., Shephard, R., Montoye, H., & Mann, G. (1979). Exercise and the cardiovascular system. PSM, 7(9), 54-71.

BEST COPY AVAILABLE

- Suinn, R., Morton, M., & Brammell, H. (1980). Psychological and mental training to increase efficiency in endurance athletes. Technical Report to Developmental Subcommittee, U.S. Olympic Women's Athletics.
- Ziegler, S. G., Klinzing, J., & Williamson, K. (1982). The effects of two stress management training programs on cardiorespiratory efficiency. Journal of Sport Psychology, 4, 280-289.

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Table 1

Physical Characteristics

Group	Sex		Years*	Height(cm)	Pre-Weight(Kg)	Post-Weight(Kg)
	M	F				
F	2	3	30.8	170.2	63.0	63.3
			17.8	12.4	10.5	10.3
FS	3	2	37.2	172.2	67.1	68.0
			15.4	7.6	11.4	10.9
FSW	3	2	30.0	176.3	82.7	82.5
			9.1	6.1	15.7	15.3
C	1	5	21.7	166.4	57.7	57.9
			4.9	9.7	9.5	9.8

*all scores are mean $\pm$ standard deviation.

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Table 2

Total Skinfold(mm)

Group	Pre	Post	F	P
F	A. 70.1*	E. 67.0	5.16	.05**
FS	23.0	25.9		
FS	B. 71.0	F. 72.5		
	32.9	30.4		
FSW	C. 108.3	G. 117.0		
	40.5	45.1		
C	D. 73.3	H. 71.7		
	16.8	16.0		

*all scores are mean $\pm$ standard deviation.

**C and G > all other means

G > C

D and F > E

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Table 3

Pre-treadmill Diastolic Blood Pressure (mmHg)

Group	Pre	Post	F	P
F	A. 62.0* 4.5	E. 61.6 4.8	3.42	<.05**
FS	B. 62.8 15.8	F. 66.8 13.5		
FSW	C. 76.0 8.9	G. 64.0 5.5		
C	D. 57.7 6.6	H. 64.3 9.8		

*all scores are mean $\pm$ standard deviation.

**C > A, B, D, E, G, and H

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Table 4

Oxygen Pulse: 9-10 Minutes (ml O₂/HR)

Group		Pre	Post	F	P
F	A.	10.6	E. 12.0	4.14	<.05**
		3.8	4.2		
FS	B.	11.6	F. 12.7		
		1.9	1.7		
FSW	C.	11.9	G. 12.6		
		3.1	3.3		
C	D.	9.3	H. 9.1		
		2.9	2.7		

*all scores are mean $\pm$ standard deviation

**A, B, C, E, F and G > D and H

B, C, E, F and G > A

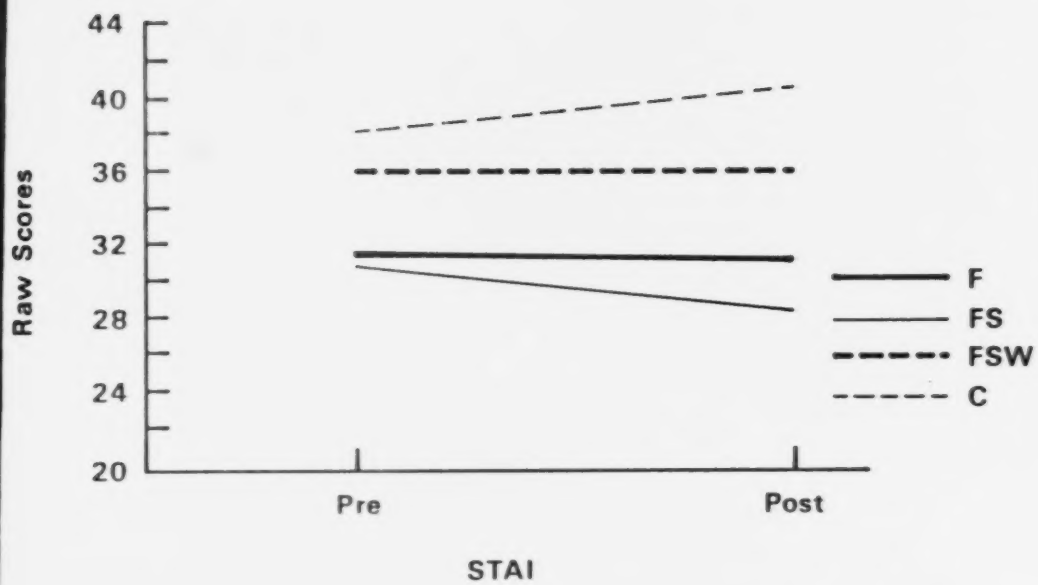
F and G > B

F > C

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Figure Caption

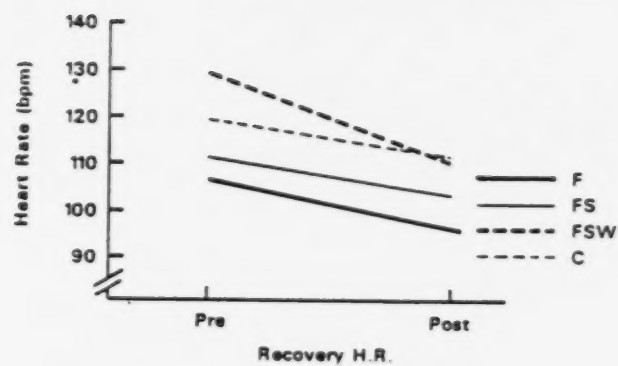
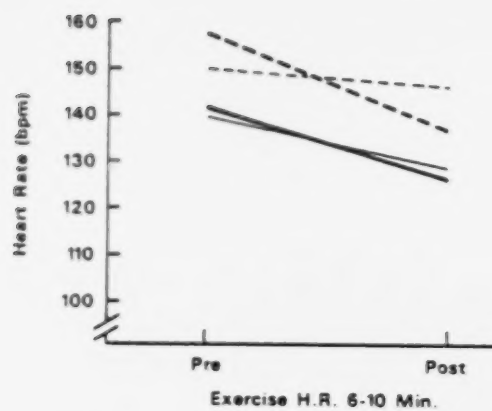
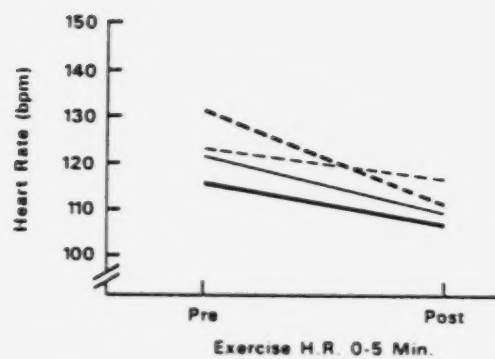
Figure 1. Trait anxiety test scores.



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Figure Caption

Figure 2. Training effect on heart rate.



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Figure Caption

Figure 3. Training effect on oxygen pulse.

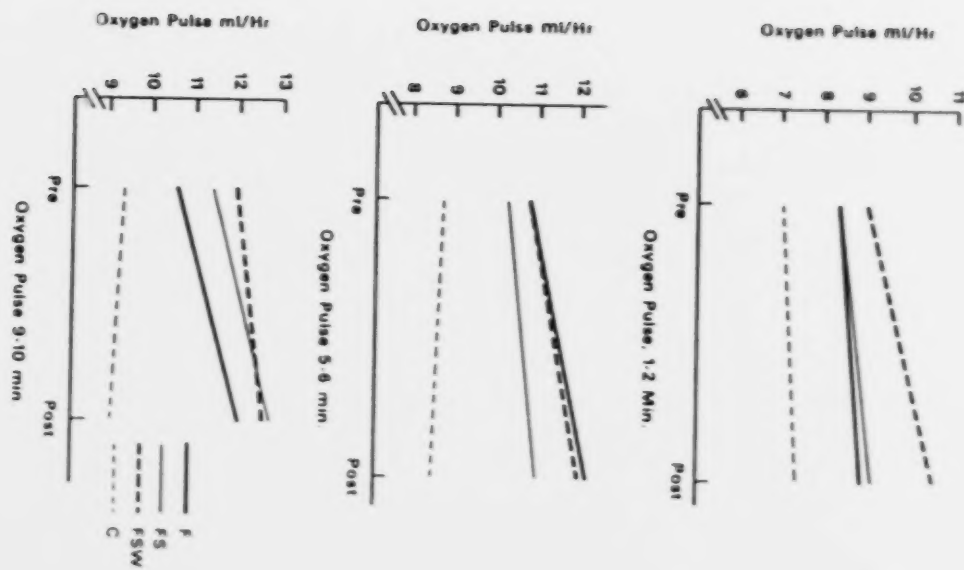
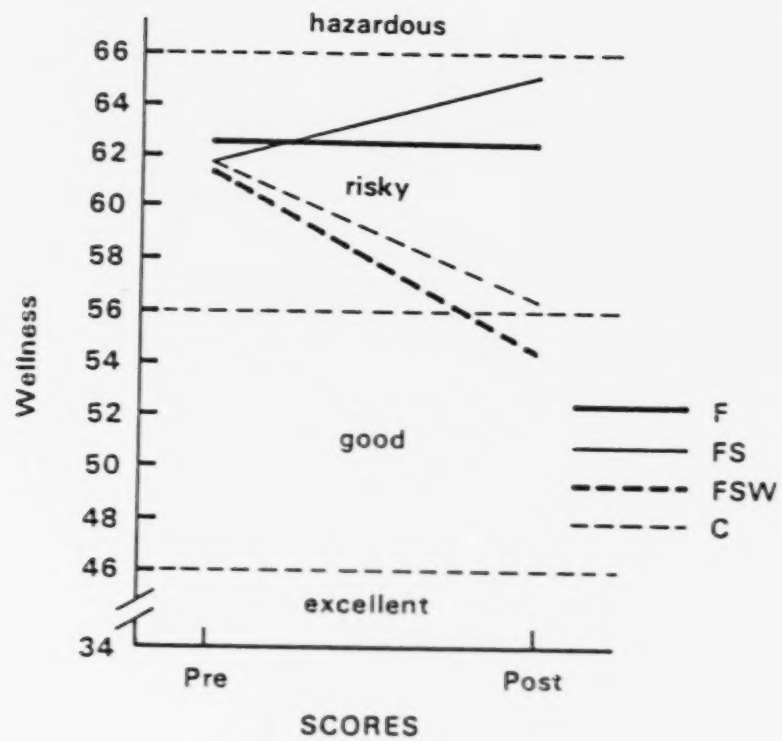


Figure Caption

Figure 4. Wellness measured by a health risk appraisal.



Lifestyle Analysis